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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | |  | 11 | |  | 10 | |  | 9 | |  | 8 | |  | 7 | |  | 6 | |  | 5 | |  | 4 | |  | 3 | |  | 2 | |  | 1 | | |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Состав бурильной колонны при бурении под эксплуатационную колонну | | | | | | | | | | Интервал 1404-3015 м по стволу (1349,8-2574,2 м по вертикали) | | | | | | | | | | Скважина \_\_\_\_\_месторождение Южно-Приобское, rev.2 | | | | | | | | | | Номер п/п | Наименование элемента | Длина без ниппеля, м | Наружный диаметр, мм | Внутренний диаметр, мм | Макс. диаметр, мм | Тип резьбы  снизу | Тип резьбы сверху | Масса, кг | | 11 | БТ ТБПК 127х9,19 | 2357,1 | 127,0 | 108,6 | 178,8 | Н-147 | М-147 | 77689,4 | | 10 | Переводник П147/133 | 0,5 | 178,0 | 89,0 | 178,0 | Н-133 | М-147 | 47,0 | | 9 | БТ ТБПК 127х9,19 | 390,0 | 127,0 | 108,6 | 168,3 | Н-133 | М-133 | 12745,2 | | 8 | Яс-172 | 3,6 | 172,0 | 76,0 | 178,0 | Н-133 | М-133 | 385,0 | | 7 | БТ ТБПК 127х9,19 | 245,5 | 127,0 | 108,6 | 166,4 | Н-133 | М-133 | 8002,0 | | 6 | Переводник П133/147 | 0,4 | 178,0 | 89,0 |  | Н-147 | М-133 | 46,0 | | 5 | ФТУ-176 | 1,0 | 176,0 | 89,0 | 176,0 | Н-147 | М-147 | 90,0 | | 4 | СИБ 2.2 с гамма модулем | 6,7 | 178,0 | 100,0 |  | Н-147 | М-147 | 1000,0 | | 3 | Обратный клапан -178 | 0,4 | 178,0 | 35,0 |  | Н-147 | М-147 | 80,0 | | 2 | ВЗД-172 | 9,7 | 172,0 |  |  | М-117 | М-147 | 1200,0 | | 1 | PDC 220,7 | 0,3 | 220,7 |  |  |  | Н-117 | 60,0 | |
| Инженерные пояснения   |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Интервал по стволу, м | Нагр.  при подъёме без цирк.,  тс | Нагр.  при спуске без цирк.,  тс | Нагр.  при вращ. над забоем,  тс | Момент при бурении,  кН·м | Момент при вращ. над забоем,  кН·м | Коэф. запаса по моменту от предела текучести | Коэф. запаса на растяжение от предела текучести | Нагрузка на долото для синус. изгиба при рот. / турб. бурении,тс | Давление при бурении,  атм | Исходные параметры | | | | | Площадь насадок долота, см2 | Расход насосов, л/с | Параметры раствора | Коэф. трения, кол. / ств. | | 1404-1500 | 53,03 | 37,43 | 39,5 | 10,90 | 6,10 | 3,96 | 2,97 | 12,40 / 12,20 | 170,14 | 8,71 | 45 | 1,37 г/см3 | 0,3 / 0,4 | | 1500-1600 | 56,88 | 39,58 | 42,19 | 11,50 | 6,80 | 3,65 | 2,82 | 12,40 / 12,20 | 174,68 | | 1600-1700 | 60,78 | 41,7 | 44,88 | 12,20 | 7,50 | 3,39 | 2,68 | 12,40 / 12,20 | 179,21 | | 1700-1800 | 64,73 | 43,81 | 47,57 | 13,00 | 8,20 | 3,22 | 2,55 | 12,40 / 12,20 | 183,75 | | 1800-1900 | 68,74 | 45,92 | 50,28 | 13,80 | 8,90 | 3,06 | 2,44 | 12,20 / 12,20 | 188,28 | | 1900-2000 | 72,99 | 48,14 | 53,09 | 14,80 | 9,50 | 2,91 | 2,32 | 9,40 / 9,40 | 192,81 | | 2000-2100 | 77,29 | 50,34 | 55,9 | 15,50 | 10,40 | 2,79 | 2,22 | 9,00 / 8,80 | 197,34 | | 2100-2200 | 81,64 | 52,32 | 58,61 | 16,00 | 11,60 | 2,68 | 2,12 | 11,60 / 11,20 | 201,86 | | 2200-2300 | 85,98 | 54 | 61,15 | 16,50 | 13,20 | 2,59 | 2,03 | 14,00 / 13,00 | 206,38 | | 2300-2400 | 90,3 | 55,33 | 63,43 | 17,20 | 14,90 | 2,50 | 1,95 | 15,80 / 14,80 | 210,90 | | 2400-2500 | 94,37 | 56,26 | 65,38 | 18,30 | 16,60 | 2,41 | 1,88 | 17,20 / 15,80 | 215,42 | | 2500-2600 | 98,04 | 56,77 | 66,95 | 19,60 | 18,30 | 2,33 | 1,84 | 18,00 / 16,40 | 219,93 | | 2600-2700 | 101,15 | 56,84 | 68,09 | 20,70 | 19,80 | 2,27 | 1,81 | 18,60 / 16,20 | 224,45 | | 2700-2800 | 104,37 | 56,89 | 69,19 | 22,50 | 21,30 | 2,19 | 1,76 | 18,80 / 16,60 | 228,97 | | 2800-2900 | 107,18 | 56,64 | 69,98 | 23,50 | 22,70 | 2,14 | 1,72 | 18,80 / 16,60 | 233,49 | | 2900-3000 | 109,19 | 55,91 | 70,23 | 24,10 | 23,70 | 2,12 | 1,69 | 18,80 / 15,60 | 238,00 | | 3000-3015 | 109,42 | 55,77 | 70,22 | 24,20 | 23,80 | 2,11 | 1,73 | 18,80 / 15,40 | 238,68 |  |  | | --- | | Примечания: Веса без учета СВП. | |

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| Интервал,  м | Нагрузка без вращения без циркуляции, тс | | Нагрузка без вращения с циркуляцией, тс | |
| спуск | подъём | спуск | подъём |
| 1400-1404 | 35,4 | 49,32 | 32,71 | 46,18 |
| 1404-1500 | 37,43 | 53,03 | 34,75 | 49,86 |
| 1500-1600 | 39,58 | 56,88 | 36,9 | 53,68 |
| 1600-1700 | 41,7 | 60,78 | 39,03 | 57,56 |
| 1700-1800 | 43,81 | 64,73 | 41,15 | 61,48 |
| 1800-1900 | 45,92 | 68,74 | 43,27 | 65,47 |
| 1900-2000 | 48,14 | 72,99 | 45,5 | 69,68 |
| 2000-2100 | 50,34 | 77,29 | 47,72 | 73,94 |
| 2100-2200 | 52,32 | 81,64 | 49,71 | 78,25 |
| 2200-2300 | 54 | 85,98 | 51,4 | 82,55 |
| 2300-2400 | 55,33 | 90,3 | 52,74 | 86,83 |
| 2400-2500 | 56,26 | 94,37 | 53,68 | 90,85 |
| 2500-2600 | 56,77 | 98,04 | 54,2 | 94,47 |
| 2600-2700 | 56,84 | 101,15 | 54,29 | 97,52 |
| 2700-2800 | 56,89 | 104,37 | 54,34 | 100,72 |
| 2800-2900 | 56,64 | 107,18 | 54,1 | 103,47 |
| 2900-3000 | 55,91 | 109,19 | 53,38 | 105,44 |
| 3000-3015 | 55,77 | 109,42 | 53,24 | 105,67 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | |  | 11 | |  | 10 | |  | 9 | |  | 8 | |  | 7 | |  | 6 | |  | 5 | |  | 4 | |  | 3 | |  | 2 | |  | 1 | | |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Состав бурильной колонны при бурении под хвостовик | | | | | | | | | | Интервал 3015-4019 м по стволу (2574,2-2589,2 м по вертикали) | | | | | | | | | | Скважина , куст , месторождение Южно-Приобское, rev.2 | | | | | | | | | | Номер п/п | Наименование элемента | Длина без ниппеля, м | Наружный диаметр, мм | Внутренний диаметр, мм | Макс. диаметр, мм | Тип резьбы  снизу | Тип резьбы сверху | Масса, кг | | 11 | БТ ТБПК 101,6х8,38 | 1539,9 | 101,6 | 84,8 | 139,7 | Н-108 | М-108 | 36910,9 | | 10 | ТБТ 101,6х19 NC 40 | 350,0 | 101,6 | 63,6 |  | М-108 | Н-108 | 16450,0 | | 9 | БТ ТБПК 101,6х8,38 " | 850,0 | 101,6 | 84,8 | 139,7 | Н-108 | М-108 | 20374,5 | | 8 | Переводник П108/102 | 0,3 | 133,0 | 50,0 | 133,0 | Н-102 | М-108 | 14,2 | | 7 | БТ ТБПК 88,9х9,35 | 1250,0 | 88,9 | 70,2 | 127,0 | Н-102 | М-102 | 27437,5 | | 6 | Калибратор КП 152,4 | 0,3 | 152,4 | 60,0 | 152,4 | Н-102 | М-102 | 18,3 | | 5 | ЗТС АРS | 19,7 | 121,0 | 63,5 | 121,0 | Н-102 | М-102 | 1300,0 | | 4 | Калибратор КП 152,4 | 0,3 | 152,4 | 60,0 | 152,4 | Н-102 | М-102 | 18,3 | | 3 | Обратный клапан КОБ-120 | 0,5 | 120,0 | 72,0 | 120,0 | Н-102 | М-102 | 47,3 | | 2 | ВЗД-120 | 7,6 | 120,0 |  | 120,0 | М-88 | М-102 | 350,0 | | 1 | 155,6 PDC | 0,2 | 155,6 |  |  |  | М-88 | 20,0 | |
| Инженерные пояснения   |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Интервал по стволу, м | Нагр.  при подъёме без цирк.,  тс | Нагр.  при спуске без цирк.,  тс | Нагр.  при вращ. над забоем,  тс | Момент при бурении,  кН·м | Момент при вращ. над забоем,  кН·м | Коэф. запаса по моменту от предела текучести | Коэф. запаса на растяжение от предела текучести | Нагрузка на долото для синус. изгиба при рот. / турб. бурении,тс | Давление при бурении,  атм | Исходные параметры | | | | | Площадь насадок долота, см2 | Расход насосов, л/с | Параметры раствора | Коэф. трения, кол. / ств. | | 3015-3100 | 85,99 | 46,2 | 58,02 | 14,50 | 11,00 | 2,66 | 2,29 | 11,40 / 10,40 | 194,05 | 5,67 | 15 | 1,15 г/см3 | 0,3 / 0,4 | | 3100-3200 | 87,59 | 45,55 | 58,21 | 15,00 | 11,50 | 2,62 | 2,25 | 11,40 / 9,80 | 196,71 | | 3200-3300 | 89,56 | 44,71 | 58,42 | 15,50 | 11,90 | 2,57 | 2,20 | 11,40 / 9,00 | 199,37 | | 3300-3400 | 91,4 | 44 | 58,63 | 16,10 | 12,40 | 2,52 | 2,16 | 11,40 / 8,20 | 202,03 | | 3400-3500 | 93,63 | 43,07 | 58,83 | 16,80 | 13,00 | 2,46 | 2,12 | 11,40 / 7,60 | 204,69 | | 3500-3600 | 96,06 | 42,04 | 59,03 | 17,50 | 13,60 | 2,41 | 2,07 | 11,20 / 6,80 | 207,34 | | 3600-3700 | 98,59 | 40,96 | 59,21 | 18,20 | 14,20 | 2,36 | 2,02 | 11,20 / 6,00 | 210,01 | | 3700-3800 | 101,16 | 39,86 | 59,36 | 18,90 | 14,80 | 2,31 | 1,97 | 11,20 / 5,40 | 212,66 | | 3800-3900 | 103,78 | 38,73 | 59,5 | 19,60 | 15,50 | 2,26 | 1,93 | 11,20 / 4,60 | 215,32 | | 3900-4000 | 106,23 | 37,72 | 59,6 | 20,30 | 16,10 | 2,21 | 1,89 | 11,20 / 3,80 | 217,99 | | 4000-4019 | 106,42 | 37,67 | 59,62 | 20,30 | 16,10 | 2,21 | 1,88 | 11,20 / 3,60 | 218,48 |  |  | | --- | | Примечания: Веса без учета СВП. | |

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| Интервал,  м | Нагрузка без вращения без циркуляции, тс | | Нагрузка без вращения с циркуляцией, тс | |
| спуск | подъём | спуск | подъём |
| 3000-3015 | 46,57 | 84,88 | 45 | 82,72 |
| 3015-3100 | 46,2 | 85,99 | 44,63 | 83,82 |
| 3100-3200 | 45,55 | 87,59 | 43,98 | 85,42 |
| 3200-3300 | 44,71 | 89,56 | 43,15 | 87,37 |
| 3300-3400 | 44 | 91,4 | 42,44 | 89,18 |
| 3400-3500 | 43,07 | 93,63 | 41,51 | 91,39 |
| 3500-3600 | 42,04 | 96,06 | 40,48 | 93,79 |
| 3600-3700 | 40,96 | 98,59 | 39,41 | 96,3 |
| 3700-3800 | 39,86 | 101,16 | 38,32 | 98,85 |
| 3800-3900 | 38,73 | 103,78 | 37,19 | 101,46 |
| 3900-4000 | 37,72 | 106,23 | 36,18 | 103,86 |
| 4000-4019 | 37,67 | 106,42 | 36,13 | 104,05 |